

ABSTRACT OF THE DISCLOSURE

A liquid crystal optical element includes two substrates, a liquid crystal layer, and at least two electrodes. The liquid crystal layer is provided between the substrates and includes liquid crystal molecules and dichroic dye molecules. The at least two electrodes are provided on the substrates so as to face each other with the liquid crystal layer interposed between them, and define one of multiple unit regions. In each unit region, the liquid crystal layer includes first and second liquid crystal regions within a range, which is approximately half or less as long as the wavelength of visible radiation as measured in a direction parallel to the surfaces of the substrates. The orientation directions of each pair of liquid crystal molecules in the first and second liquid crystal regions have azimuthal directions defining an angle of approximately 90 degrees while no voltage is being applied between the electrodes.